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2018 Interactive Media Arts Senior Year
Capstone Project Proposal
@NYU Shanghai
“The Hunger Index”

Section I Project Title:

In consideration of this capstone topic subject, its main form of delivery, this capstone project will be named: *The Hunger Index*.

Section II Project Statement of Purpose

When thinking about China, two things come to mind: the astonishing magnitude of the Chinese population and the passion that Chinese people have for food. The two combined has produced a palatable consumer market. As of 2017, the sheer market size of the food and beverage section has totaled a staggering 4 trillion RMB (around \$630 billion). According to the “2017中国互联网生活本地服务蓝皮书” [Eleme 2017 Food and Beverage Industry Report¹], the transaction volume of the food delivery market reached 115 billion RMB, which is around \$18 billion. According to the “2017年第一季度中国第三方餐饮外卖市场研究报告” [2017 First Quarter Report for China Third-party Food Delivery Service Market²], the total user of online food delivery service apps has reached 194 million, with a quarter on quarter growth rate of 13.5%.

Numbers in industry reports rarely serve as the best visual communication tools. A more vivid rendering of the above numbers would be the food delivery packages growing out of your neighbourhood garbage bin. This capstone project is prompted by the concern for the environmental impact of food delivery packages generated in the process of online to offline food delivery. The project uses Eleme, the largest professional online-to-offline catering and food delivery platform in China, as a research subject to understand the food delivery industry in China.

The project will take the form of an interactive storytelling piece on the web that educates the user about the environmental impact of their online ordering behavior through personalized data visualization and audio and visual storytelling methods. This capstone aims to raise customers’ awareness of their edible environmental footprints and the

¹ Translation added by the author of this project proposal.

² Translation added by the author of this project proposal.

importance of recycling. In doing so, the project also fills the blank of what actually happens between the online ordering and the reception of delivery.

Section III Literature and Art, Perspectives and Contexts

The research phase of this project is divided into two stages. In stage one, the research focuses on the conceptual context, testifying the hypothesis and understanding the background of this project: 1) academic literature that validates the concerns over the environmental impact of food delivery service; 2) governmental regulations regarding food deliveries and garbage disposal. In stage two, the research focuses on the medium and methodologies of actually implementing this project: 3) an engaging interactive storytelling strategy; 4) the employment of the web as a storytelling medium. The main two aspects of using the web as a storytelling medium that this project is concerned with are user experience design for the web, and information graphics as a visual aid for web storytelling. The success and effectiveness of the project is contingent to the implementation of the research findings in these directions. Below is an annotated bibliography.

Marsh, Kenneth, Bugusu, Betty, and Tarver Tony. "Food Packaging and its Environmental Impact." *Food Technology Magazine*, The Institute of Food Technology, Apr 1st, 2017., www.ift.org/~media/Knowledge%20Center/Science%20Reports/Scientific%20Status%20Summaries/Editorial/editorial_0407_foodpackaging.pdf

This study synopsis introduces the science and considerations behind food packaging technology. It summarizes the food compatibility, recyclability of the packaging material. According to the synopsis, food packaging accounts for almost two-thirds of total packaging waste by volume and half of the total packaging sales by weight. The synopsis remarks that packaging technology must "balance food protection with other issue, including energy and material cost, heightened social and environmental consciousness, and strict regulations on pollutants and disposal of municipal solid waste" (Marsh). In demonstrating the environmental cost of food packaging, this synopsis validates that the concerns that this capstone project hopes to address. It also provides a matrix for estimating the environmental cost of the commonly used packaging materials by restaurants.

United States Environmental Protection Agency, "Reducing Wasted Food & Packaging: A Guide for Food Services and Restaurants", www.epa.gov/sites/production/files/2015-08/documents/reducing_wasted_food_pkg_tool.pdf This report also proposes a list of strategies for reducing wasted food and packaging. As research shows in the report, reducing food packaging can "conserve energy and reduce greenhouse gas emissions". It also suggests a methodology created by EPA called the "[Waste Reduction Model \(WARM\)](#)" to help solid waste planners and organizations track and voluntarily report greenhouse gas (GHG) emissions reductions from several different waste management practices. More importantly this report also provides detailed instructions on the tracking, data collecting and analysis of wasted food and packaging. This capstone project adopts such methods when estimating and calculating the pollution of delivery packages.

Garrett, Jesse James. *The Elements of User Experience: User-Centered Design for the Web and Beyond*. New Riders, 2011.

Garrett explores the methodologies for optimizing user experience on the web, by dividing the process into a five-plane conceptual framework: the surface plane, the skeleton plane, the structure plane, the scope plane and the strategy plane. In very concise terms, the surface plane represents the layout that the user sees; the skeleton plane explains the logic behind the layout; the structure plane represents the site map, i.e. the information architecture of the website; the scope plane integrates various features and functions in the most reasonable way; and the strategy plane finds the crosspoint where the goal of the user intersects with that of the website creator.

In general, the book provides a manageable approach to creating a user experience when there are many aspects that require balancing -- usability, identity, information architecture and interaction design. However the majority of the examples in the book is catered to the needs of online businesses. Its application is largely situated in a commercial context.

Although this project does not necessarily fall into the target audience group of the book, many methodologies and frameworks still apply. Using the five-plane approach, this project starts with setting a strategic goal, establishing a key idea to be conveyed to the user, which is to raise environmental awareness among food delivery service users. Confining the project to a certain scope eliminates irrelevant data and prioritizes relevant information. The conceptual goal of this project then determines the website navigation and information architecture, which will then be used to identify the most effective way of visual display.

Rendgen, Sandra, et al. *Information Graphics*. Taschen GmbH, 2016.

The book starts with the most rudimentary way of visual communication -- primitive cave paintings. In the introductory essays, the editors discuss human's struggle to make sense of everything in the age of information explosion and how data has changed journalism. Followed by a comprehensive study on various design examples, such as projects and campaigns, the book then explores the methods and design principles for creating effective information graphics based on location, time, category and hierarchy.

The book is a well-illustrated source of inspiration for anyone interested in data visualization and information graphics. More importantly, the data and information representation of a few projects appear particularly noteworthy for this capstone project. "The Digital Dump" (See Fig. 1) shows the amount of digital waste produced around the globe each years and the ways in which they are recycled or disposed. Common electronic waste are represented in flat icons, categorized, geographically mapped according to the e-waste destination. It tells a compelling story of the impact that the digital age has on the planet. "The Little Book of Shocking Global Facts" (Example see Fig. 2) educates the reader on global issues such as poverty, healthcare system, global warming with data and infographics.

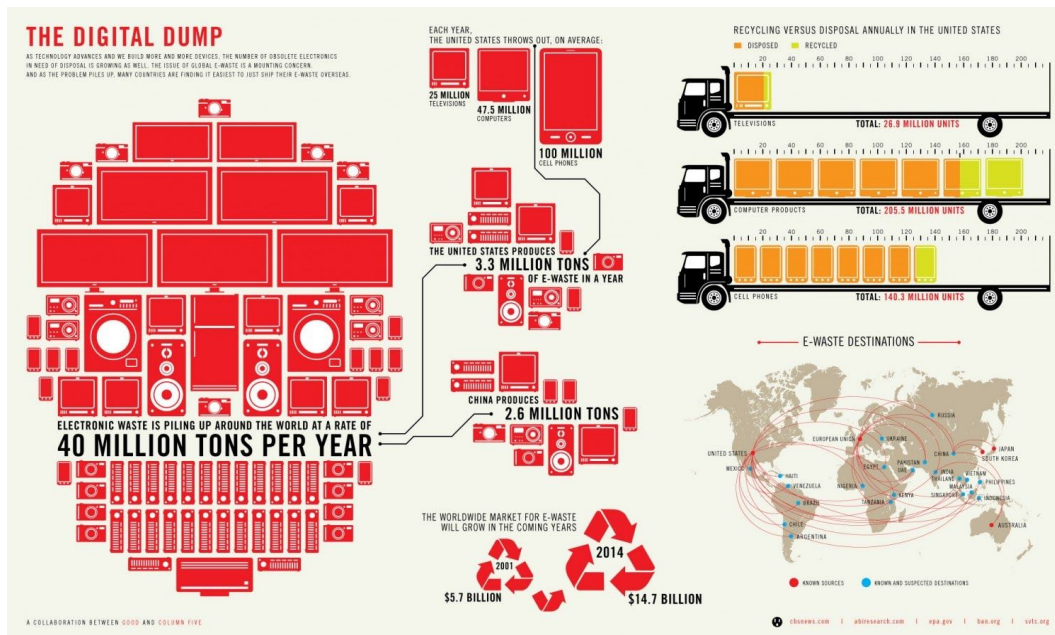


Fig. 1 "The Digital Dump"

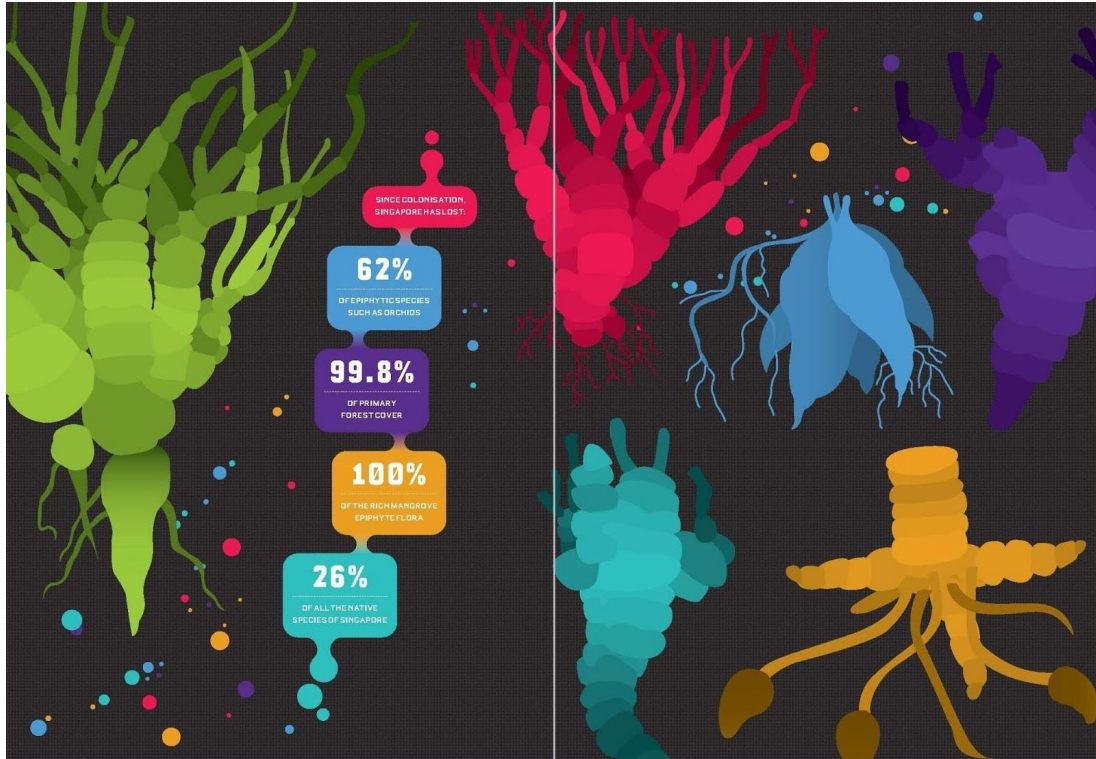


Fig. 2 Example from “The Little Book of Shocking Global Facts”

Bruni, Luis Emilio, et al., editors. *Interactive Storytelling: 8th International Conference on Interactive Digital Storytelling*. Springer International Publishing, 2015.

This book is a collection of essays that were presented at the *International Conference on Interactive Digital Storytelling*, the premier annual venue that gathers researchers, developers, practitioners and theorists to present and share the latest innovations, insights and techniques in the expanding field of interactive storytelling and the technologies that support it.

The essay “Design Approaches for Interactive Digital Narrative” explores the heuristics and design process for constructing an interactive digital storytelling experience. The author discusses the existing approaches to interactive narrative design, then proposes his own 4-phase design process: paper phase, from idea to treatment to flow diagram; prototype phase, checking interaction and flow without the final assets; production phase, creating final assets, structure and interaction; and testing phase, involving beta user testing and final adjustments. The essay also presents a few design heuristics, such as the cuberbardic principle, which stresses the importance to leave enough space for the user to explore and experience, and the initial interest principle, which focuses on creating interests. This essay provides great grounding principles for approaching an interactive narrative storyline, emphasizing on a strong strategy for initial engagement and the importance of telling instead of showing. As the project enters the production phase, it is important to employ these principles to actively engage the users from the start, to retain users once they are on the website and to allow them space and time to explore and create their own unique experience with the project.

Krug, Steve. *Don't Make Me Think!: a Common Sense Approach to Web Usability*. New Riders, 2017.

In this book, Krug focuses on human-computer interaction and web usability. Krug argues that a good website should let users achieve their goal as easily and directly as possible. The first rule of usability presented in the book, “Don't make me

think”, argues for a self-evident and self-explanatory navigation process. In one of the chapters, the author hypothesizes that designers should design for scanning, because users nowadays scan but not read for information. This design principle dictates the visual hierarchy and the amount and the position of text. Krug also discusses the importance of creating navigation breadcrumbs for the user to locate themselves on the website.

The book provides a comprehensive guidance to interaction design on the web and website usability maximization. Krug’s advice on intuitive navigation design, visual hierarchy design and usability testing is extremely helpful for the implementation of this project. Although this project will not take on information architecture as complicated as the ones mentioned in the examples, it still remains a challenge for this project to balance between overwhelming the user with information and not leaving an impression as the user scans the page.

Parker, Warby. “2014 Make-Your-Own Annual Report.” Warby Parker, 2014, www.warbyparker.com/annual-report-2014.

Warby Parker’s annual report both in 2013 and 2014³ are extremely successful in their visual communication. In particular, the 2014 report invites the user to input information about themselves and based on their preferences for certain questions, the report generates a personalized annual report of anecdotal predictions, ranging from user’s Latin motto, favorite emoji to their spirit animal. Although these predictions are far from accurate, the individuality and exclusivity of the report merit special attention. By asking the user to answer a few simple questions, the generated report appears more personal, in some sense more “truthful” and genuine. Involving the user also makes the message that is being conveyed more about the user and less about Warby Parker itself.

The goal of this capstone project is to raise environmental awareness. Inviting user to participate in quick questionnaires is in itself a form of user interaction but also a way to transform users from spectators to participants, from being educated to self-realization. Generic findings are informative; however, it is the information personal to the user that sticks.

Case, Nicky. “The Evolution of Trust.” It’s Nicky Case!, July 2017, <http://ncase.me/trust/>.

In this project, Case experiments with trust through an interactive game: the society consists of five types of characters -- our modern society composition simplified -- and depending on whether the user “cheats” or “cooperates”, the user and the characters will receive or lose points. As the game progresses, the user will see a pattern in this game of elimination and how the society is shaped by the players.

“The Evolution of Trust” goes from the shallow to the profound. It starts from the user playing against another character. It then asks the user to bet on the winner when all five characters are involved. It then increases the type of players and the number of rounds that the characters play against each other to mimic the real world. Progressively developing a narrative is a great way to show underlying influence of seemingly insignificant or irrelevant behavior. This capstone project adopts such strategy as the project leads the user to realize the environmental impact of food delivery services. It starts with showing the user their seemingly insignificant ordering behavior, and then multiplies the impact of the behavior to the total consumer base to show the significance of ostensibly insignificance.

Monteiro, Fabrice. “The Prophecy.” The Prophecy, Fabrice Monteiro Photography, Oct. 2015, <https://fabricemonteiro.viewbook.com/>.

In this project, photographer Fabrice Monteiro investigates world’s environmental crises, such as climate change, drought, pollution, rising sea levels, habitat destruction, through the camera lens. “The Prophecy” uses elaborate costumes and sets

³ Link to annual report 2014: <https://www.warbyparker.com/annual-report-2014>

to put faces and human bodies on the problems facing the world. It shines a spotlight of many facets of life in Africa and the problems and sufferings of the people there. The project takes on a surrealistic documentary format to humanize abstract environmental concepts. It is visually impactful and direct. This capstone project also hopes to integrate photographic measures to enhance the visual impact of the projects.



Fig. 1.3 *The Prophecy*

“买买买背后的垃圾王国” [*The Junkyard Behind the Shopping Spree*⁴]. thepaper.cn, 澎湃新闻, 10 Nov. 2017, t.cn/RlgKneF

“买买买背后的垃圾王国” [*The Junkyard Behind the Shopping Spree*] is an interactive H5 news campaign project by The Paper, one of China’s leading digital news outlets. The campaign project aims to bring to the public attention the environmental impact of packaging waste from shipping services. Last year’s “Double 11”, i.e. single’s day in China, witnesses a frenzied shopping spree with breathtaking transaction record of \$25.3 billion, a 40% spike up than the year before. The campaign unfolds as the user scrolls through photographs of unpacked shipping goods alongside with their packaging material. This method is particularly effective in that it forces the audience’s attention to what is out of sight most of the time. When one receives a new package, the desire to see what is inside overpowers attention paid anywhere else. The only time that excessive packaging is taken note of is when it becomes a nuance to see what is inside.

The campaign conveys its purpose via visualization of the excessive and environmentally unfriendly packaging. Putting numbers to each type of packaging material to evaluate its environmental impact is a powerful demonstration of the campaign purpose. However the campaign is less successful in directing the users’ attention to themselves. One of the disadvantages in showing generic data and information is that the user might have a hard time attributing what is seen to their own doing. Overly comprehensive information produces a “tragedy of the commons” in user experience, making the campaign less impactful.

⁴ Translation added by the author of this project proposal.

IV. Project Description

This capstone project is inspired by the genuine interest in food delivery service and the recognition of both the convenience and the environmental impact thereof. Driven by a desire to fill in the missing link between the “submit order” button on Eleme application interface and the knock on the door, this capstone project begins with field work to understand the mechanism in the delivery ecosystem. Initial field work includes interviews with white-collar workers in office buildings during lunch hours as they come to pick up their food deliveries, interviews with riders to establish a baseline on their working hours, wage level, employment status (part-time, full-time, etc), platform association, daily routine, interview with restaurants to inquire their packaging choice, information on packaging manufacturers, and the recyclability of the packaging.

After initial field work is completed, this capstone project moves on to gathering user data. Unfortunately due to the unavailability of Eleme API, the database has to be put together manually. It was opportune that Eleme released its annual individual report during this phase of the project. Data was gathered through surveys from acquaintances and scraping data from weibo posts with the hashtag “Eleme annual report”. Inconveniently the annual report is in graphic format, which encumbers data processing. [Special note: Every data entry was typed out]

With the manually typed out database, it is possible to conduct analysis, speculate and hypothesize the customer ordering behavior. After the consolidation of these information, customers are grouped into four categories (“Waimai Newbie”, “Waimai Pro”, “Waimai Expert”, “Waimai Fanatics”) based only on the frequency that they make their orders. The project then filters the relevant information pertaining to the environmental effect and synthesizes these information into a user profile. As the users navigate to the website, they are prompted with 2-3 questions that inquire about their ordering behavior. Based on their answer, they will be classified into one of the four categories. Afterwards their user profile will be displayed as interactive infographics. Their ordering habits will then be translated into their environmental footprint “foodprint”. In the following section, the user gets to explore how they can make a difference by ordering differently, or recycle in a better way. The purpose of this section is to help the user visualize the significant difference they could be making by slightly altering their ordering habits. In the penultimate section, as a homage to the riders who have braced thunders and storms to deliver food, the project deviates temporarily and takes on a humanistic approach to portrait the daily life of a rider, most likely through photography and video captures. In the last section, the project advocates for reducing the environmental cost of food and beverage delivery service section, listing specific doable advice for the user, for example where to locate the opt-out for utensil option, how to recycle better, and try to avoid restaurants with excessive packaging.

The convenience brought by the instant food delivery services has been enjoyed by many. However, this does not constitute an excuse to overlook the environmental impact that comes along with that convenience. Yet again it is imprudent to completely abandon it. Nor is it realistic to advocate for its abandonment. The way to address is to retain the convenience but minimize its environmental cost. The environmental aspect has only recently been in the public sight, but its significance has yet to reach the greater public. This project does not necessarily take on a social activist approach to address the issue, but simply offers insights for the user. In raising their interest in the subject matter in general, this project hopes to also raise their awareness of their environmental footprint.

V. Project Significance

Companies and platforms have already started to recognize the environmental impact of delivery services. Both Eleme and MeiTuan, two dominating O2O food delivery platforms, have launched various campaigns to encourage customers to opt-out for utensils. Eleme’s environmental challenge promises that if the total number of customers who opt-out for utensils exceeds 5 million, for every 1000 people who opt-out, Eleme will plant a tree in regions that suffer from

desertification. As comforting as it is to know that the platforms are actively engaged, it is far from sufficient to running a healthy delivery ecosystem. This capstone project hopes to help users visualize their environmental “foodprint” and the differences they could be making without having to completely abandon the use of food delivery services.

The immediate goal of this project is to inform and educate the user on the immediate measures they could take to reduce their environmental “foodprint”. Through prompted questions and interactive infographics, this project aims to guide the user to gain insights to their ordering behavior. Through that insight the project will help the users recognize the environmental impact of their ordering habits. According to data gathered, less than one in ten people have opted-out for utensils in the year 2017. Following interviews show that the opt-out option is only available in the latest version of the Eleme app, which many users either have yet to update to or are not aware of the availability of the opt-out option.

A long-term potential that the project would like to explore is the possibility to engage in other divisions in the delivering chain, including the upstream packaging producers, food delivery platforms and the downstream recycling departments in the government. This project hopes to persuade food delivery platforms to leverage restaurants with the platform’s bargaining power to pressure restaurants to use environmentally friendly packaging. In addition, this project hopes to show that customers do factor in the environmental friendliness of restaurants in their decision making process. By showing this, this project hopes to incentivize the platforms to conduct more environmental campaigns. This project also hopes to engage governmental attention, because the recycling of packaging material is as important as using decomposable packaging material. Some easy to implement actions range from setting up special recycling bins for food packages to imposing regulations on food container manufacturers to meet certain environmental standards.

VI. Project Design & Production

The medium of this capstone project will take on the form of a website, for the following reason: 1) easy access with little or no geographical constraint; 2) easy to share; 3) manageable forms of interaction. The topic of this capstone project does allow other medium forms, for example, physical installation. However in consideration of the portability of the project, using the web as the project medium seem to be the most reasonable. In addition, constructing the project on the web also allows for scalability and continuity in the future.

Several design principles grounds the aesthetic choices of this capstone project: 1) clear and appealing infographics design; 2) flat graphic design; 3) less is more, minimalistic stylistics choice. The majority of the project will take on the form of static and interactive infographics. Since infographics design constitutes a significant part of the project, several aspects merit attention: text-to-graphics ratio, which determines the allocation of information and the optimized information hierarchy; jargon and terminology usage, because the project inevitably involves terminologies pertaining to certain professional field of study, for example chemistry, the language employed in the infographics needs be adapted to best suit the users’ understanding and to ensure that the information is understandable and relevant. The design will also try to use less numbers but more powerful numbers. It is very difficult for the audience to visualize uncommonly large numbers. Instead of pausing and contemplating the significance of the numbers or associating the number with their own behavior, users tend to respond with an acknowledgement of “Wow! That is a big number” and then move on to process the next number.

The interaction form of this capstone project inherits the forms of interaction available on the web, meaning clicking, scrolling, dragging and dropping, etc. The form of interaction dictates the graphic design and the distribution of information. Scrolling based interactive infographics has to consider the amount of information the user can take in per scroll. This project needs to balance between having too little information where the user terminates his experience with few scrolls, and having too much information that the user does not have sufficient time to process everything.

The user testing process will be divided into two parts: 1) the effectiveness of storytelling narrative; 2) effective solutions for the concerns that this project aims to address. In part one, users will be asked to evaluate the effectiveness of the two storytelling narrative on paper: one relies more on interactive infographics, the other leans more towards a mini game, where users can pack their own food and their environmental friendliness will be evaluated based on the packaging they choose. In part two, this project will place additional garbage bins specific for food delivery packaging recycle purposes. This measure aims to gauge if a better recycling system would increase the amount of packaging waste being recycled. Part two of user testing will start promptly as soon as permission is obtained.

The technological skill sets necessary for this capstone project mainly involves web development knowledge. The website will be constructed with HTML and styled with CSS. The interactive elements will be built with Javascript and JQuery. Interactive infographics animation will be done with Greensock timeline animation. The project will also use React.js when deemed necessary. This capstone project will also require some level of JSON knowledge to manipulate data on the fly as the user interacts with the website. In addition to front-end web development, the project also requires certain statistical knowledge for data processing to gain insights to customer ordering habits, generate ordering user profile, and to dynamically change the infographic display as the user explore with different ordering habits. And finally the project requires server setup and using FTP protocol to transfer information.